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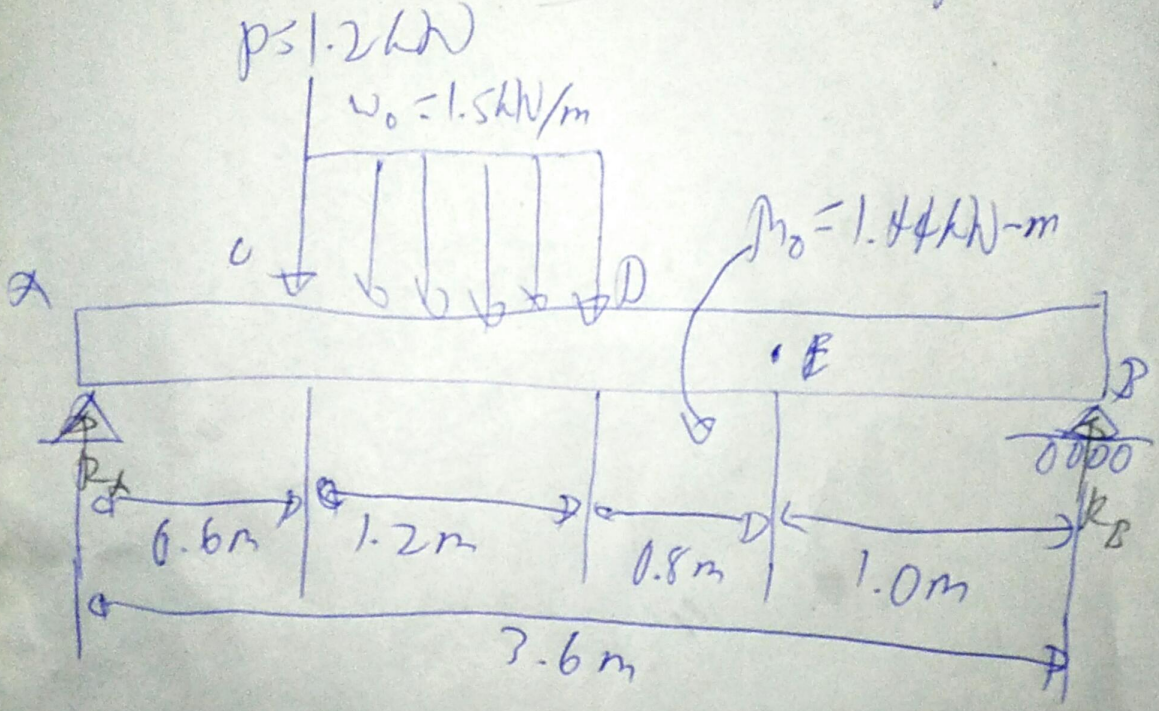
CE 5 Structural Analysis Problem 2



$\sum M_B = 0$: (+

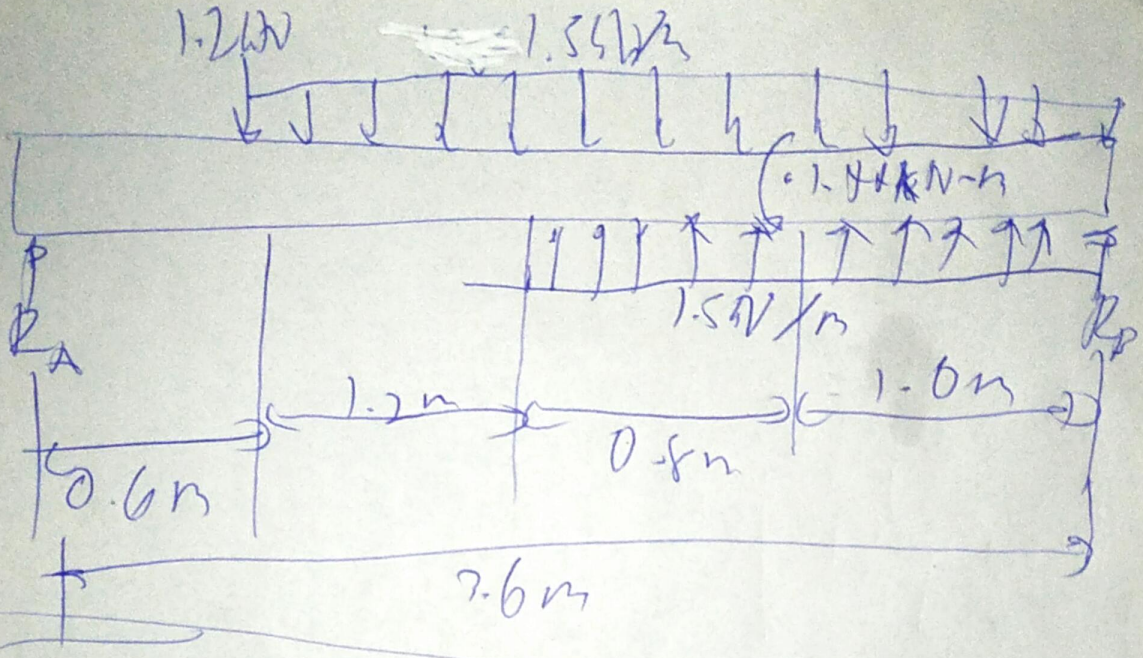
$-R_A(9.6) + 1.2(7.0) + 1.5(1.2)(2.4) + 1.44 = 0$

$R_A = 2.6$ kN

$\sum F_y = 0$:

$2.6 - 1.2 - 1.5(1.2) + R_B = 0$

$R_B = 0.4$ kN



$$M = 2.6x - 1.2\langle x-0.6\rangle - 0.75\langle x-0.6\rangle^2 + 0.75\langle x-1.8\rangle^2 - 1.44\langle x-2.6\rangle^0$$

check!

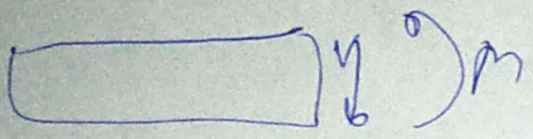
$M(3.6) = 0$

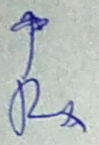
$$V = \frac{dM}{dx} = 2.6 - 1.2\langle x-0.6\rangle^0 - 1.5\langle x-0.6\rangle + 1.5\langle x-1.8\rangle$$

check

$V(3.6) = -0.4$

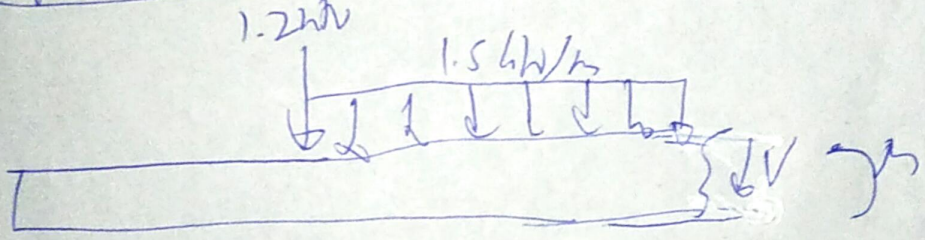
$V(3.6) + R_B = 0$

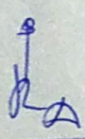




$M = 2.6\alpha$

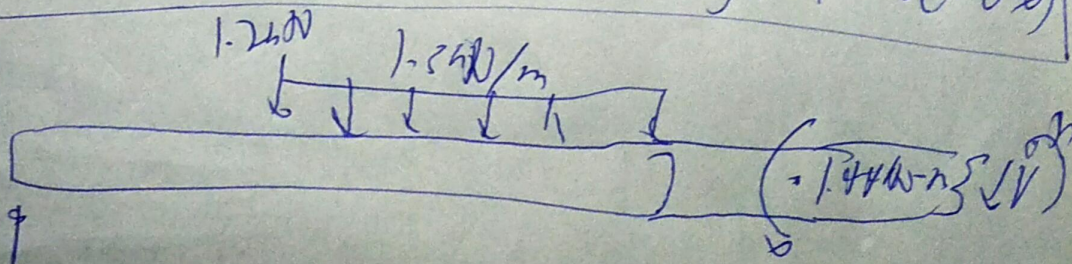
$V = 2.6$

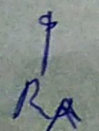




$M = 2.6\alpha - 1.2(\alpha - 0.6) - 0.75(\alpha - 0.6)^2$

$V = 2.6 - 1.2 - 1.5(\alpha - 0.6) = 1.4 - 1.5(\alpha - 0.6)$

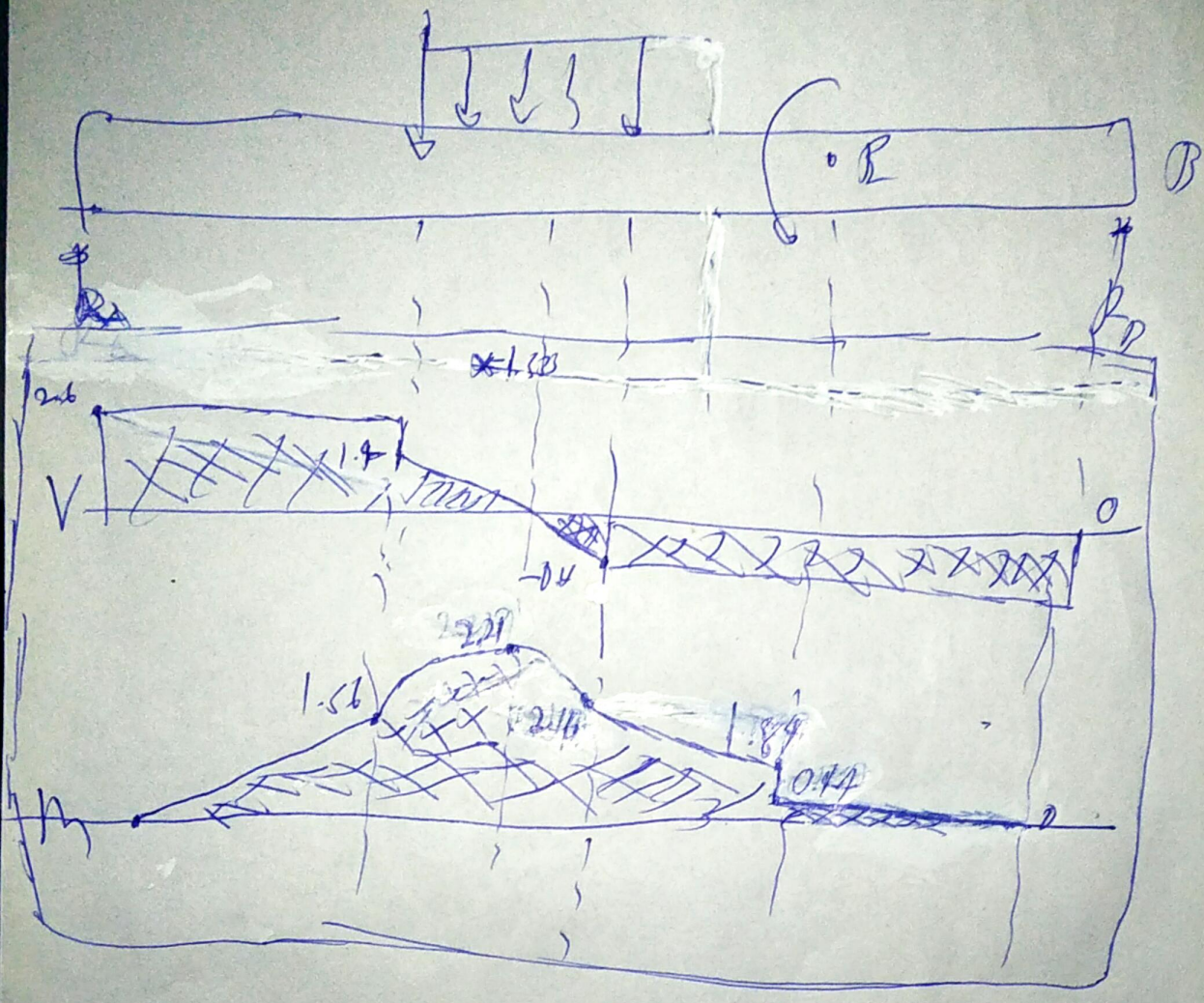




$M = 2.6\alpha - 1.2(\alpha - 0.6) - 0.22 - 1.44$

$M = 2.6\alpha - 1.2(\alpha - 0.6) - 1.71$

$V = 2.6 - 1.2 - 1.5(1.8 - 0.6) = -0.4$



$$V_D = 1.4 - 1.5(1.8 - 0.6)$$

$$\boxed{V_D = -0.4\ kN}$$

$$M_D = 2.6(1.4) - 1.2(1.4 - 0.6) - 0.75(1.4 - 0.6)^2$$

$$\boxed{M_D = 2.16\ kN\text{-}m}$$